

I have watched the planet through the greater part of a revolution; the greenish yellow of the great equatorial belt remained unchanged. I have drawn the attention of several observers to the colours of the belt, some of whom have been in the habit of observing it for many years. One of these gentlemen says that he is certain that the equatorial belt has not presented such an appearance as at present for a quarter of a century.\*

Writing to Mr. Proctor some time since, I said that I thought the very small specific gravity of *Jupiter* might be due to the existence of a cloudy envelope of enormous extent. Mr. Proctor replied, that he thought it just possible that the whole light from the planet might not be reflected; but that some portion might be emitted by the body of the planet. The same idea had presented itself to me. Being by far the largest planet in the solar system, it will certainly have retained more heat than the rest.

Such an alteration in the colour of the planet as I have described, must, I think, indicate some considerable change, either on the surface of the planet or in its atmosphere. In the hope of throwing some light on such changes in future, I am making a careful map of the spectrum of the planet. When this is completed I shall have the honour of submitting it to the Society.

### *Selenographical Notes: Apenninus and adjacent Regions.*

By C. H. Weston, Esq.

Few lunar objects are more striking than the range of *Apenninus* lying S.E. of *Mare Imbrium*. It not only presents forms unlike the commonly existing circular structures, but when viewed on the *terminator* of an increasing Moon (and definition good) exhibits broad shadings on its massive flanks and serrated outlines mapped out in light upon the low lands far beneath.†

During the last month the decreasing Moon was examined under favourable circumstances on the morning of the 27th when just east of the meridian. Her age about  $20^d\ 13^h\ 30^m$ . By her libration a little more of the NNE. quadrant was made visible than in mean position. The *terminator* was particularly interesting, as its extremities passed so very near both the lunar poles. On or near the *terminator* the following striking points were carefully identified:—Region near North Pole, *Anaxagoras* on east of terminator, *Barrow A* on west (shadow fine), *Epigenes* on east, *Aristoteles*, *Eudoxus*, *Calippus*, on east, *Menelaus* on east, *Agrippa* on east, *Godin* on east, *Delambre*, *Taylor* on east, south-west end of valley between *Taylor* and b.c. south-east of *Taylor*, *Kant*, *Descartes*, *Abulfeda*, *Almanon*, *Sacro-bosco*,

\* Since writing the above I have received information which leads me to suspect periodicity in the change of colour on *Jupiter*.

† During a partial eclipse (when illumined objects could be contrasted with dark parts) details were finely seen by the larger Newtonian (14.25 in. 16 ft.)

*Gemma Frisius, Maurolycus, Clairaut, Jacobi, Pentland, Simpelius,* and region north-west of South Pole. On the south-east *Sharp* could be detected, and the high mountain range north-west of *Newton*.\* The extreme south peripheral regions of mean Moon were cut off by libration.†

On 26th *Scoresby* (south-west of North Pole) and two contiguous *ellipses* were seen, but (by the same libration) under greater than the mean visual angles, and therefore apparently more circular than in Beer and Mädler's map. *Gioja*, too, and the mountainous range still further north, which conceals the North Pole point.‡

It is best, first, to describe the cliff-like coast line of *Apenninus* and adjacent regions areographically. The lower general surface of *Mare Imbrium* (except when broken by the rays of *Copernicus* and low ranges) is apparently continued at about the same level to *Apenninus*, and extends from *Eratosthenes* to the vicinity of *Huygens*, where, I conceive, should have been introduced in the valuable lunar map an equally dark continuous shading, as far as and around *Huygens*, to meet the shading at the foot of the promontory in the rear, and so sweeping round and onward to the ranges still more retired. At the last point begins the elevation of the floor of *Mare Imbrium*, and extends north-east towards *Timocharis* and round to *Archimedes*. I do not think, however, that this elevation should have been continued unbroken or so little broken. There seems to be an interrupted valley of some width, running north-east and south-west from *Archimedes* to *Apenninus*, co-extensive with the base of the former, and somewhat, perhaps, wider near the latter. Under low telescopic powers (in this phase of the Moon) it assumes not only a tripartite structure, but (at the end abutting against *Apenninus*) a broken shaded triangular form. Under high powers we perceive in it incipient or low protrusions, circular and rugged, and the shaded triangular part loses its character and is found marked with several hill ranges and deep dark combs. The *south-west patch* has considerable ridges, consisting apparently of great arcs of curves, connected like festoons with the convexities towards the valley, and together occupying about its whole length. It is true, indeed, that at full Moon the valley shows the brilliancy characteristic of raised lunar surfaces, but the experienced eye can see that while above the level of the *Mare Imbrium* it is lower than the contiguous patches.§

\* A peak in the vicinity is the highest part of the Moon ("Der Mond," B. & M.)

† Under favourable libration and latitude the exact locality of South Pole can be observed through an opening in *Malapert* (B. & M.)

‡ On this range rises a peak sufficiently high to be *always* enlightened by the Sun and so to enjoy perpetual day, while the plains on the north base experience as constantly the ever-recurring vicissitudes of day and twilight (B. & M.)

§ Positive and negative photographs were taken of the Moon during last

On the north-west of the valley the elevated patch appears dome-shaped, and as *Autolycus* occupies the central position, the idea is suggested that the Ringgebirg was the ultimate result of the upheaving forces. At the north-west point above *Hadley* there is (as in the lunar map) a slight depression.

The entire Apennine region (Das Apenninen Gebirg und Hochland of B. & M.) is a large triangular district of which the promontory north-west of *Hadley* is the apex and the north-east converging side the one arresting our attention. In this side may be noticed about seventeen marked breaks, with the principal elevations standing out in high relief. Gigantic spurs (Vorberge, B. & M.), and rather high ranges are also to be seen running south-west, leaving profound intervening valleys. Beginning north, *Hadley*, *Aratus*, *Bradley A*, *Bradley*, *Huygens*, *Huygens A*, *Wolf A*, can be traced towering up more or less strikingly,—*Huygens A*, the highest (about 21,000 feet, B. & M.)

The physical characters of this part of *Apenninus* are those of a mountainous region, abruptly terminating on one side, running for a great distance in a course very direct, with subordinate ranges branching off at right-angles to the coast-line. These features present a structure very similar to that displayed on good maps of the Himalayan chain, where the great spurs and the lesser elevated lines of hills, are at right-angles to its main axis, while the sudden fall of *Apenninus*' coast-line to the level of *Mare Imbrium*, is also analogous to the Asiatic breakdown of the high land of Thibet to the low level of Hindostan.

It is as important to the selenologist as it is to the geologist to obtain some approximate knowledge of the chronological sequence of the different formations (or modifications) of the lunar crust. The general appearance of *Mare Imbrium*, running up direct (and to so great an extent unchanged in area level) to the very foot of *Apenninus*, would lead to the inference that their physical condition existed anterior to the more local and limited upheaval of the small patches north and south of the valley of *Archimedes*. The north patch indicates that expansive forces had first produced the domical form, and then ultimately found vent in the ejection and building up the crater of *Autolycus*. These are symptoms of continuous, or at least, of protracted igneous action. *Archimedes* is probably posterior in age to the south patch, because the great ridging and elevation of high hill ranges seem to be rather connected with his protrusion. Again while it is clear that the *Apennine* range ran up to and beyond *Eratosthenes*, it is also probable that it once extended to *Copernicus*. If so, it would then follow that the elevation of this most magnificent Ringgebirg with its radial system, would, *pro tanto*,

month, and at the full Moon of this. On cursory views both showed decided triangular shading, but the translucent glass positives (much magnified) viewed both on collodionized and non-collodionized surfaces, and under different angles of light (*over black velvet*) distinctly showed the details of the *Archimedean* valley and the south-west patch ridged with hill ranges.

have obliterated the continuity of this range (as appears to be the case), and consequently be newer in age. On tracing carefully the direction of one of the north rays of *Copernicus* we find it to bifurcate near the *south patch*, and one of the branches to touch and become lost in or under it. There are often great niceties in judging of the effects of these rays, and inferences must be drawn cautiously, but, on the whole, I think that this branch underlies without ridging the patch. The connection of the raised parts with the branching and curvilinear elevations being already hypothetically accounted for, it would then follow that the ray is older than the south patch. Lastly, as to the remaining question of the relative ages of the *Apennine* range and *Eratosthenes*, I should consider this Ringgebirg as last formed, because its circular shape gives evident proof that nothing has interfered with its form since its upheaval, while the *Apennine* range seems to have been clearly interrupted by *Eratosthenes*. Hence, I infer the relative ages of these localities and districts to stand thus in a descending series (beginning with the newest), *Autolycus*, *Archimedes* (and perhaps the hill ranges on the south patch), *north and south patches*, *Copernicus*, *Eratosthenes*, *Apennine* range, *Mare Imbrium*.

Enleigh Observatory, Lansdowne, Bath,  
27 Sept. 1869.

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*On his new Observatory at Churt, Surrey.*  
By R. C. Carrington, F.R.S.

I have bought the freehold of almost nineteen acres of land situated six miles to the south of Fareham, on a part of Frensham Common, in the village of Churt. It contains a conical hill, sixty feet high, which is entirely detached, and it was this that induced me to purchase it. It goes by the name of The Middle Devil's Jump, as in another spot near by there is the Devil's Punch-Bowl. Its situation by the Ordnance Survey is

Lat.  $51^{\circ} 8' 49''$  N.

Long.  $0^{\text{h}} 3^{\text{m}} 1^{\text{s}}.7$  West of Greenwich.

Alt. about 340 feet above Liverpool.

Farnham is the nearest post-town and railway-station. It is necessary to state this, as I find letters and parcels continue to be addressed to me at Redhill, though I have left it seven years ago.

There are three things I wish to speak of, the Observatory in itself, the clock, and the principal instrument.

Being on a hill I did not want elevation, so I have sunk the